ACCESSION NR: AP4009468 S/0051/63/015/006/0818/0820

AUTHOR: Burakov,V.S.; Naumenkov,PA.

TITLE: Investigation of the composition of the gas cloud of an alternating current arc

SOURCE: Optika i spektroskopiya, v.15, no.6,1963,818-820

TOPIC TAGS: ac arc cloud, arc cloud composition, plasma composition, plasma analysis, electrode evaporation, alloy analysis, steel analysis, chromium, iron, spectroscopic analysis

ABSTRACT: The purpose of the work was to determine the absolute and relative concentrations of the atoms of the electrode material in the zone of an alternating current arc and to compare the results yielded by two different procedures, namely, determination with reference to the contours of the spectrum lines and by analysis of the condensate of the vapor with the arc burning in a closed vessel. Most of the measurements were carried out with chromium and iron electrodes. For the spectroscopic determinations there were used the 4254.4, 4274.8 and 4289.7 Å lines of Cr and the 4045.8, 4063.6 and 4071.7 Å lines of Fe. The line contours were determined

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AP4009468

from spectrograms photographed by means of a set-up consisting of a Fabry-Perot etalon crossed with a KSA-1 spectrograph. The procedure employed in collecting and analyzing the vapor condensates is described elsewhere. (V.S.Burakov and A.A.Yankovskiy,Inzh.-fiz.zhurn.No.10,19,1959). The results are tabulated and shown in a figure. The results yielded by the two entirely different procedures differ by less than 10%, which indicates that both procedures are suitable for investigating the composition of plasmas. Additional experiments to determine the relation between the concentration of elements in electrodes and in the arc cloud were carried out using low and medium alloy steel electrodes. The results obtained for the chromium-iron alloy electrodes show that the concentration ratio of Cr to Fe in the arc cloud is 1.2-1.3 higher than the concentration ratio in the alloy. This ratio is fairly constant so that there is direct proportionality between the relative concentration of the elements in the cloud and in the alloy electrodes. Orig.art.has: 1 formula, 1 figure and 1 table.

ASSOCIATION: none

SUBMITTED: 25Feb63 DATE ACQ: 03Jan64 ENCL: 00

SUB CODE: PH NR REF SOV: 007 OTHER: 004

Card 2/2

NAUMENKOV, P.A.

Determining the degree of inhomegenity and concentration of atoms in the flame of a low-voltage pulse discharge. Teploriz. vys. temp. 2 no.2:176-180 Mr-Ap '64. (MIRA 17:6)

1. Institut fiziki Akademii nauk BSSR.

L 08357-67 EWT(1)

ACC NR: AR6028132 SOURCE CODE: UR/0058/66/000/005/D033/D034

AUTHOR: Burakov, V. S.; Zhukovskiy, V. V.; Naumenkov, P. A.; Yankovskiy, A. A.

TITLE: Investigation of atomic absorption spectra of an electric discharge with spatially separated emitting and absorbing layers

61

SOURCE: Ref. zh. Fizika, Abs. 5D235

REF. SOURCE: Tr. Komis. po spektroskopii AN SSSR, v. 2, vyp. 1, 1964, 478-483

TOPIC TAGS: absorption spectrum, atomic spectrum, electric discharge, gas discharge spectrosocopy

ABSTRACT: A method is proposed for obtaining atomic absorption spectra, based on the spatial separation of the same electric discharge into absorbing and emitting layers. Unlike the existing methods of atomic absorption analysis, the proposed method ensures the production of atomic absorption lines with high excitation energy. A study is made of the influence of the discharge parameters and of the method of introducing the substance in the discharge on the character of the spectrum. The possibility is discussed of using the obtained discharge to measure the relative probabilities of the transitions and to solve analytic problems. [Translation of Abstract]

SUB CODE: 20

Card 1/1 nst

L 01246-67 EWT(1)

ACC NR: AP6030708 SOURCE CODE: UR/0368/66/005/002/0133/0137

AUTHOR: Burakov, V. S.; Zhukovskiy, V. V.; Naumenkov, P. A.; Yankovskiy, A. A.

ORG: none

38B

TITLE: Investigation of atomic absorption spectra of an electric discharge with radiative and absorptive layers separate in space

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 2, 1966, 133-137

TOPIC TAGS: atomic spectrum, absorption spectrum, pulse discharge, spectral line, oscillation strength

ABSTRACT: A simple method is described for obtaining atomic absorption spectra with the aid of pulse discharge. Possibilities are analyzed for practical applications of the results in spectral analysis and for determining the relative oscillator strengths of multiplet lines. Orig. art. has: 2 figures and 1 table. [Based on authors' abstract] [NT]

SUB CODE: 03/ SUBM DATE: 27Aug65/ ORIG REF: 009/ OTH REF: 004/

Card 1/1 hs UDC: 535.34

NAUMENKOV, P. V.

Naumenkov, P. V.

"The content and method of working on the word, its ambiguity, homonymy, and synonymy, in the fifth through seventh classes (based on material from the English language)." Moscow City Pedagogical Inst imeni V. P. Potemkin. Moscow, 1955. (Dissertation for the degree of Candidate in Pedagogical Sciences)

Knizhnaya letopis
No. 15, 1956. Moscow

NAUMENKO, A.I.

Variations of pressure in a hermetically closed cranial cavity.
Fiziol.zhur. 42 no.8:660-667 Ag '56. (MLRA 9:11)

1. Kafedra normal'noy fiziologii 1-go Leningradskogo meditsiny
institute im. I.P.Pavlova.
(BRAIN, physiology,
pulse & pressure in hermetically closed cranial
cavity (Rus))

F

Country : RUMANIA
Category: Laboratory Equipment. Instrumentation

Abs Jour: RZhKhim., No. 17, 1959, No. 60692

Author : Naumescu, M., [illegible], A.; Munteanu S.
Inst : -
Title : Automatic Apparatus for pH Measurement

Orig Pub: Rev. chim., 1958, 9, No 11, 630-631

Abstract: No abstract

Card : 1/1

KAMBAROV, Yu.G.; MEKHTIYEV, S.D.; Prinimali uchastiye: SEROV, A.A.;
NAMESTNIKOVA, V.M.; DZHAZALIYEVA, R.D.; NAUMETS, A.M.

High-speed pyrolysis of the gasoline fraction in a pilot plant. Khim. prom. no.5:346-348 My '63. (MIRA 16:8)

NAUMETS, I.A.

Expansion of the Saratov Hydrolysis Plant. Gidroliz. i lesokhim. prom. 16 no.6:25-26 '63. (MIRA 16:10)

1. Saratovskiy gidroliznyy zavod.

NAUMETS, Nikolay Ivanovich, ispolnyayushchiy obyazannosti prof. kand. tekhn. nauk; ZHIRKOVICH, Sergey Vladimirovich, ispolnyayushchiy obyazannosti prof. kand. tekhn. nauk; ABAYEV, I.I., inzh.; PERCHENKO, A.G., st. pepod.; SHABANOV, A.D., dots., kand. tekhn. nauk, retsenzent; YUSTINSKIY, E.A., inzh., retsenzent; ANTONOV, V.P., tekhn. red.

[Hoisting machinery used in building] Gruzopod"emnye stroitel'nye mashiny. 2-ia chast' posobiia po kursu stroitel'nykh mashin. Kuibyshev, Kuibyshevskii inzhenerno-stroite. in-t, 1962. 416 p. (MIRA 17:2)

NAUMETS, N.I., kandidat tekhnicheskikh nauk.

Determining the tractive force required for moving tamping-type rollers. Stroi.i dor.mashinostr. 2 no.7:23 Jl '57. (MIRA 10:7)
(Road rollers)

NAUMETS N.I.

NAUMETS, N.I., kand. tekhn. nauk.

Determining efficient speeds for soil compacting rollers. Stroi. i dor. mashinostr. 2 no.11:21-22 N '57. (MIRA 11:1)
(Rollers (Earthwork))

NAUMETS, N.I., kand. tekhn. nauk.

[redacted]

Calculating bending machines. Stroi. i dor. mashinostr. 3 no.1:29-30 Ja '58. (MIRA 11:1)

(Bending machines)

NAUMETS, N.I., kand.tekhn.nauk, dots.

Designing soil-tamping machines. Stroi. i dor. mashinostr. no.4:20-21 Ap '58. (MIRA 11:4)
(Soil stabilization)

NAUMETS, Z.P., aspirant

Importance of PPLO in the etiology of infectious sinusitis in turkeys. Veterinariia 41 no.1:60-62 Ja '64. (MIRA 17:3)

1. Ukrainskiy nauchno-issledovatel'skiy institut eksperimental'noy veterinarii.

NAUMEYKO, I.P.

Machinery operators stand with front rank fighters in fulfilling the resolutions of the party. Mekh.sil'.hosp. 10 no.11:7 N '59. (MIRA 13:3)

1. Predsedatel' kolkhoza im.Shevchenko Zolotnoskogo rayona, Cherkasskoy oblasti.
(Zolotonosha District--Collective farms)

NAUMIK, A.

[redacted]

Osteo-articular tuberculosis in rural areas in the Lubin district.
Gruzlica 20 no. 5:683-692 Sept-Oct 1952. (CLML 24:2)

1. Of Lublin Regional Consultation Center for Tuberculosis (Head--W. Kwit, M.D.). 2. Work done for the Institute of Tuberculosis.

NAUMIK, Aleksander; PIETRON, Kazimierz

A case of ulcerative stenosis of the duodenal bulb related to duodenal diverticulum. Pediat. polska 33 no.8:970-972 Aug 58.

1. Z Oddzialu Chirurgii Dzieciecej P.S.K. Nr 3 w Lublinie Dyrektor Szpitala i Kierownik Oddzialu: dr med. A. Naumik. Adres: Lublin, ul. Sklodowskiej 46 m. 6.

(PEPTIC ULCER, in inf. & child
  ulcerative stenosis of duodenal bulb with duodenal diverticulum, case report (Pol))
(DUODENUM, diverticula
  with ulcerative stenosis of duodenal bulb in child, case report (Pol))

NAUMIK, Aleksander; PIETRON, Kazimierz

A case of acute occlusion of the lower duodenum. Pediat. polska 33 no.8: 973-976 Aug 58.

1. Z Oddzialu Chirurgii Dzieciecej PSK. Nr 3 w Lublinie Dyrektor Szpitala i Kierownik Oddzialu: dr med. A. Naumik. Adres: Lublin, ul. Sklodowskiej 46 m. 6.

(INTESTINAL OBSTRUCTION, in inf. & child
duodenal, case report (Pol))

NAUMIK, Aleksander (Lublin, ul. Sklodowskiej 46 m. 6.)

Surgical aspects of gastric and duodenal ulcers in children. Pediat. polska 34 no.1:1-12 Jan 59.

1. Z Oddzialu Chirurgicznego P.S.K. Nr 3 w Lublinie Kierownik Oddzialu: dr med. A. Naumik.
(PEPTIC ULCER, in inf. & child.
surg (Pol))

NAUMIK, A.

Prof. Witold Klepacki, M.D. Pediat.polska 35 no.10:1177-1179
O '60.

(OBITUARIES)

GOLOVKIN, Mikhail Pavlovich; NAUMOV, A.F., retsenzent; NAUMKIN, A.N., inzh., retsenzent; RAMODIN, V.N., inzh., retsenzent; SOLDATENKOV, A.G., retsenzent; YEFIMOV, G.P., kand.tekhn.nauk, red.; MEDVEDEVA, M.A., tekhn. red.

[Design and operation of motor operated loaders] Ustroistvo i ekpluatatsiia avtopogruzchikov. Moskva, Vses.izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1961. 77 p. (MIRA 14:12)

1. Abkhasian A.S.S.R. Statisticheskoye upravleniye.
(Abkhazia—Statistics)

NAUMKIN, D.I.

Insulation of signaling cables and signal light foundations from traction current effects. Avtom., telem. i sviaz' 9 no.7:32 Jl '65. (MIRA 18:8)

1. Starshiy inzh. Nizhnedneprovsk-Uzlovskoy distantsii Pridneprovskoy dorogi.

NAUMKIN, D.I.

Measurement of the value of a code current in track circuits.
Avtom., telem. i sviaz' 9 no.11:28-29 N '65.
(MIRA 18:12)

1. Starshiy inzh. Nizhnedneprovsk-Uzlovskoy distantsii Pridneprovskoy dorogi.

NAUMKIN, Ivan Fedorovich, gornyy inzhener; BABOKIN, I.A., redaktor; GRISHAYENKO, N.I., redaktor; ALADOVA, Ye.I., tekhnicheskiy redaktor.

[Safety engineering in underground coal mining] Tekhnika bezopasnosti pri podzemnoi dobyche uglia. Moskva, Ugletekhizdat, 1955. 303 p. [Microfilm] (MLRA 9:1)

(Coal mines and mining--Safety measures)

NAUMKIN, I.F., inzhener.

Fires in mine ventilation shafts. Bezop. truda v prom. 1 no.1:16-19
Ja '57. (MLRA 10:4)

(Mine fires)

NAUMKIN, Ivan Fedorovich; MIKALENKOV, S.P., otv.red.; GRISHAYENKO, M.I., red.izd-va; PROZOROVSKAYA, V.L., tekhn.red.

[Safety engineering in coal mines] Tekhnika bezopasnosti v ugol'nykh shakhtakh. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1960. 373 p. (MIRA 13:4)
(Coal mines and mining--Safety measures)
(Coal miners--Diseases and hygiene)

NAUMKIN, I.

Coming in 1961. Sov.shakht. 10 no.3:41-42 Mr '61. (MIRA 14:7)

1. Glavnyy redaktor Gosgortekhnizdata.
(Bibliography--Coal mines and mining)

NAUMKIN, Ivan Fedorovich; GELESKUL, M.N., nauchnyy red.; PROKOF'YEVA, L.G., red.; NESMYSLOVA, L.M., tekhn. red.

[Safety engineering in coal mines] Tekhnika bezopasnosti na ugol'nykh shakhtakh. Moskva, Proftekhizdat, 1962. 210 p.
(MIRA 16:6)

(Coal mines and mining--Safety measures)

DUBETS, Stepan Grigor'yevich; PLOTNIKOV, Aleksey Mikhaylovich;
NAUMKIN, I.F., nauchn. red.; BYKOVA, I.V., red.

[Industrial training of miners of horizontal and inclined workings; the coal industry] Proizvodstvennoe obuchenie prokhodchikov gorizontal'nykh i naklonnykh vyrabotok; ugol'naia promyshlennost'. Moskva, Proftekhizdat, 1963. 102 p.
(MIRA 17:4)

NAUMKIN, K. I.

Naumkin, K. I.

"Encouraging the older students to study through the komsomol class organization." Min Education RSFSR. Moscow State Pedagogical Inst imeni V. I. Lenin. Moscow, 1956. (Dissertation for the Degree of Candidate in Pedagogical Science)

So: Knizhnaya letopis', No. 2[illegible], 1956

NAUMKIN, N. I., TARTAKOVSKIY, P. D. and EFRUSSI, M. M.

"Experimental Study [illegible]"

paper presented [illegible] All-[illegible] Conf. [illegible]

CHERTAVSKIKH, A.K.; TIKHONOV, B.S.; NAUMKINA, I.V.; NIKITIN, V.I.

Nonoxidizing annealing of OTsS4-4-2,5 bronze in endothermal gas. Trudy Giprotsvetmetobrabotka no.24:307-313 '65.

(MIRA 18:11)

11295

S/136/60/000/01/009/021
E091/E255

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F. and Naumkin, O. P.

TITLE: Erbium and its Alloys

PERIODICAL: Tsvetnyye metally, 1960, Nr 1, pp 43-48 (USSR)

ABSTRACT: The authors have investigated the physico-mechanical properties of erbium and its reaction with a few of the metals commonly met in industry. These investigations are a continuation of a cycle of published studies, carried out at the laboratory of rare metal alloys of the Institute of Metallurgy, AS USSR on the physico-chemical properties of rare earth metals and their alloys (Refs 3 to 8). Metallic erbium of 99.35% purity was used for the study. It contained the following chief impurities: Nd 0.1%, Ho 0.28%, Tu 0.1%, Y 0.1%, Th 0.2%, Ca 0.02%, Fe 0.01% and Cu 0.007%. The microstructure of the original cast metallic erbium is shown in Fig 1. The hardness of metallic erbium (H_m) is 130 to 135 kg/mm^2 (Vickers). Its hardness after remelting in an argon atmosphere rose by 10 to 15 kg/mm^2. The density of erbium was determined by a hydrostatic method, and also by X-ray analysis. The results were respectively

ard 1/5

S/176/60/000/01/009/[illegible]
B091/B255

[illegible]

[illegible]

Card 3/5 [illegible]

[illegible]
S/136/60/000/01/006/021
E091/E255

Erbium and its Alloys

area was observed. The authors have studied the physico-chemical reactions of erbium with the basic components of industrial alloys - Mg, Al Fe, Ti and Ta. Alloys were cast of the above metals with additions of 5 wt % erbium. Fig 3 shows the microstructure of an Al-5% erbium alloy, Fig 4 that of an Fe-5% erbium alloy and Fig 5, that of a tantalum-erbium alloy. It was found that erbium in quantities of 5% can be melted with Al, Mg, Fe and Ti with the formation, in all cases, of 2-phased mixtures of the eutectic of peritectic type. For all investigated alloys, erbium is a good modifier and strengthener. It does not alloy with Ta. As erbium is extremely rare and expensive, it cannot be used as an alloying element for industrial alloys. Its fields of application can be in construction of special instruments, in electronic apparatus and in other directions where its particular physical properties (eg ferromagnetism, optical properties, etc) can be exploited. The further study of erbium and its alloys must concentrate on the complex of physico-chemical

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68590

S/156/60/000/01/009/021
E091/E255

Erbium and its Alloys

properties, with the aim of developing precision alloys with special physical properties. There are 5 figures, 1 table and 11 references 9 of which are Soviet, 1 German and 1 English.

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22802

18.1246 1416, 1454, 3515

S/136/61/000/005/005/008
E111/E152

AUTHORS: Savitskiy, Ye.M., Terekhova, V.F., and Naumkin, O.P.

TITLE: Ultra-light lithium alloys

PERIODICAL: Tsvetnyye metally, 1961, No.5, pp. 58-61

TEXT: Of the three metals with density under unity, sodium, potassium and lithium, the latter is both the lightest and most suitable for use in alloys. Considerable use has been made of it for deoxidizing and degassing (Refs. 1-3) and in the USSR it has been used as an alloying addition in light alloys. The object of the present work was to see whether super-light lithium alloys could be produced by adding magnesium and aluminium, which would be suitable both mechanically and in corrosion resistance for use in instruments and construction materials. For preparing binary magnesium-lithium alloys, lithium was fused under a LiCl + KCl flux and then magnesium was added, the temperature not exceeding 700 °C. For high-lithium aluminium alloys the same procedure was used, but if the lithium content was low it was added to fused aluminium. Melting was effected in armco-iron crucibles and after removal of flux alloys were poured into copper moulds. The ingots

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S/136/61/000/005/005/008
E111/E152

Ultra-light lithium alloys

were extruded at 200-240 °C to 10-mm diameter rods, the extrusion flow pressure decreasing from 70 to 30 kg/mm^2 with increasing lithium content. Alloy compositions and densities (determined by apparent loss in weight in paraffin) are given in Table 1 (where headings of first and second columns are "alloy compositions, % by weight from charge composition" and "density, g/cm^3", respectively; words in first column are "silumin"). Five alloys with densities 1.05-1.30 g/cm^3 were studied further. Their coefficient of thermal expansion is given in Table 2 (where the second column is headed "coefficient of linear expansion at -85 to 0 °C, degree^{-1} x 10^6"; the footnote being "for calculating the coefficient the average of the length change on heating and cooling was taken"). The mechanical properties of deformed (extent not given - abstractor) alloys are given in Table 3 (where column headings are: 1) composition, % by weight; 2) hardness HV, kg/mm^2; 3) compression strength kg/mm^2; 4) relative contraction in compression; 5) nature of fracture; 6) tensile strength kg/mm^2; 7) relative reduction in cross-sectional area, %; 8) specific strength. In column 5 alloys 1, 2, 4, "ductile, no fracture test", the others, "brittle". The footnote to column 8 reads "specific

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Ultra-light lithium alloys

S/136/61/000/005/005/008
E111/E152

strength of magnesium 7.4, aluminium 2.3, lithium 2.2". Corrosion resistance in 3% aqueous NaCl (weight loss, g/m^2.hour) and in 90% humidity air (weight gain, g/m^2.day) is given in Table 4. In this table the heading of the 1st column is "composition, % by weight", 2nd and 3rd columns the two corrosion parameters given above; words in 2nd column "reaction with solution". The authors recommend ternary alloys with 7-15% Al, 15-25% Li and 60-80% Mg as structural alloys when lightness is needed; alloys with densities below unity can be used as a filler for tubes to make them rigid and yet light, as vibration absorbers under oil in instruments, and for other purposes.
There are 1 figure, 4 tables and 5 references: 4 Soviet and 1 English. The English language reference reads:
Ref.3: Robert S. Busk, J. of Metals, Vol.188, No.7, July 1950.

Card 3/6

SAVITSKIY, Yevgeniy Mikhaylovich, prof., doktor khim. nauk;
TEREKHOVA, Vera Fedorovna; BUROV, Igor' Vladimirovich;
MARKOVA, Inessa Aleksandrovna; NAUMKIN, Oleg Pankrat'yevich;
MUKHIN, G.G., red.izd-va; **GUSEVA**, A.P., tekhn. red.

[Rare-earth metal alloys]Splavy redkozemel'nykh metallov. Moskva, Izd-vo Akad. nauk SSSR, 1962. 266 p. (MIRA 15:12)

1. Laboratoriya redkikh metallov i splavov Instituta metallurgii im.A.A.Baykova (for all except Mukhin, Guseva).
(Rare earth metals)

NAUMKIN, O. P.,

"Special properties of scandium, its oxidation, and its use as a getter"

report presented at the Conf. on New Trends in the Study and Applications of Rare Earth Metals, Moscow, 18-20 Mar 63

L 12917-63 EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD/ESD-3 JD/JG/IJP(C)

ACCESSION NR: AP3000200 S/0136/63/000/005/0051/0053

AUTHOR: Savitskiy, Ye. M.; Terekhova, V. F.; Naumkin, O. P.; Burov, I. V. 66 65

[redacted]

TITLE: Growing scandium, yttrium, and gadolinium single crystals

SOURCE: Tsvetny*ye metally*, no. 5, 1963, 51-53

TOPIC TAGS: single crystals, scandium, yttrium, gadolinium, microhardness

ABSTRACT: A method of growing Sc, Y, and Gd single crystals has been developed at the Institut metallurgii im. A. A. Baykova (Institute of Metallurgy). The commercial grades of these metals have a purity not exceeding 98%. Oxygen, calcium, copper, iron, tantalum, fluorine, and other rare-earth metals are the main impurities. The commercial-grade Sc, Y, and Gd were first refined by electron-beam zone melting and high-vacuum distillation to a purity of 99.3 to 99.5%, mainly, by removal of such impurities as O_2, Ta, and Ca. The dissolved rare-earth metals could not be eliminated. Single crystals with cross sections of 5 x 5 to 10 x 12 mm were grown from distilled metals by recrystallization annealing in vacuum at 1000 — 1400C (depending on the metal). Other methods of crystal growing did not yield satisfactory results. The crystal orientation was determined by x-ray diffraction. The average microhardness of Sc single crystals

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L-12917-63

ACCESSION NR: AP3000200

was 210 kg/mm² on the basis face and 100 to 110 kg/mm² on the prism face. Studies of the electrical and magnetic properties, coefficient of heat expansion, and ductility of Sc, Y, and Gd single crystals are being continued and will be the subject of another report. Orig. art. has: 4 figures.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metallurgy)

SUBMITTED: 00 DATE ACQ: 14Jun63 ENCL: 00

SUB CODE: ML,MA NO REF SOV: 003 OTHER: 003

Card 2/2

CHECHERNIKOV, V.I.; IULIU POP; NAUMKIN, O.P.; TEREKHOVA, V.F.

Magnetic properties of scandium. Zhur. eksp. i teor. fiz. 44 no.1:387-389 Ja '63. (MIRA 16:5)

1. Moskovskiy gosudarstvennyy universitet i Institut metallurgii AN SSSR.

(Scandium--Magnetic properties)

L 11119-63 EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD IJP(C)/JD

ACCESSION NR: AP3003105 S/0056/63/044/006/1826/1828

AUTHOR: Chechernikov, V. I.; Pop, Iuliu; Naumkin, O. P. 61 57

TITLE: Magnetic properties of scandium single crystals

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 1826-1828

TOPIC TAGS: scandium, single crystal, scandium single crystal, magnetic susceptibility, temperature dependence, recrystallization annealing, Curie temperature, magnetic field, orientation

ABSTRACT: Magnetic properties of scandium single crystals and their temperature dependence have been studied. The scandium metal, obtained by reduction of scandium fluoride with distilled calcium, contained a maximum 0.11% of oxygen, 0.015% carbon, 0.006% molybdenum, 0.04% nitrogen, 0.02% calcium, and 0.0089% hydrogen. A single crystal 6 x 9 x 14 mm was obtained by recrystallization annealing of an arc-melted ingot. The recrystallization annealing was performed in a vacuum of 10^{-5}—10^{-6} mm Hg at 1350C for 8 hr. The magnitude of magnetic susceptibility of a single crystal at temperatures from 77 to 1100K was found to depend on the orientation of the magnetic field and was greater with the magnetic

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L 11119-63
ACCESSION NR: AP3003105

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field parallel to the c axis of the crystal than with the field perpendicular to this axis (see Fig. 1 of Enclosure). The temperature of the paramagnetic Curie point determined from the magnetic susceptibility—temperature dependence was found to be 1300K for parallel orientation and 900K for perpendicular orientation of the magnetic field. "The authors express their thanks to Professor Ye. I. Kondorskiy for discussing the results of the work and for his valuable comments and to Professor Ye. M. Savitskiy and V. F. Terekhova for their assistance." Orig. art. has: 1 figure and 1 formula.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet (Moscow State University); Institut metallurgii Akademii nauk SSSR (Institute of Metallurgy of the Academy of Sciences SSSR)

SUBMITTED: 12Jan63 DATE ACQ: 23Jul63 ENCL: 01

SUB CODE: EL,PH NO REF SOV: 002 OTHER: 001

Card 2/2

S/053/63/079/002/003/004
B102/B186

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F., Naumkin, O. P.

TITLE: The physico-chemical properties of the rare-earth metals, scandium and yttrium

PERIODICAL: Uspekhi fizicheskikh nauk, v. 79, no. 2, 1963, 263 - 293

TEXT: This is a review article that covers the most important literature of the last 10 years. It contains the following chapters: (1) Electron structure of the rare-earth metals; (2) Chemical properties; (3) Physical properties (lattice structure, density, melting point and polymorphous transition point, vapor pressure, boiling point and evaporation temperature, thermal expansion, electrical properties, specific heat and thermal conductivity, magnetic properties); (4) Mechanical properties (elastic constants and their temperature dependence, methods of investigating the mechanical properties, hardness, mechanical properties in the case of deformation, pressure treatment of rare-earth metals). There are 14 figures, 15 tables, and 116 references.

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ACCESSION NR: AP4004686 S/0126/63/016/005/0663/0668

AUTHORS: Naumkin, O. P.; Terekhova, V. F.; Savitskiy, Ye. M.

TITLE: Anisotropy of properties of scandium single crystal

SOURCE: Fizika metallov i metallovedeniye, v. 16, no. 5, 1963, 663-668

TOPIC TAGS: anisotropy, scandium property, scandium anisotropy, scandium single crystal, thermal emf, scandium microhardness, scandium magnetic property, single crystal anisotropy, crystal anisotropy, magnetic property, single crystal, scandium

ABSTRACT: The electrical, mechanical, and magnetic properties of scandium single crystals have been investigated. Specimens (9 x 6 x 14 mm) were prepared by the method of recrystallization annealing. At room temperatures the crystal exhibits a close-packed hexagonal structure, determined by the Laue method. The specimen is shown to possess an anisotropy along the principal direction of the hexagonal lattice. The magnitude of anisotropy determined by measuring the thermal emf along axes a and c was 200%, using the expression $e_{Sc} = -\frac{\Delta E_a}{\Delta E_c} \cdot e_c + e_{Cu}$. Measuring the micrchardness on the planes (0001) and (10$\bar{1}$0), this value was 100%, whereas the inverse paramagnetic permeability in a field parallel and perpendicular to the

Card 1/2

ACCESSION NR: AP4004686

c-axis gave a value of 30% at room temperature. The microhardness on the (0001) plane was 210 kg/mm^2 and on $(10\bar{1}0)$ it was 102 kg/mm^2. "The author is grateful to R. M. Liberman (Giredmet) for procuring the specimens, to V. Sh. Shekhtman (IMET im. A. A. Baykova) for helping in crystal orientation, and to A. A. Babareko (IMET im. A. A. Baykova) for his advice." Orig. art. has: 4 figures, 2 tables, and 2 formulas.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute of Metallurgy)

SUBMITTED: 16Jan63 DATE ACQ: 03Jan64 ENCL: 00

SUB CODE: MM NO REF SOV: 004 OTHER: 006

Card 2/2

SAVITSKIY, Ye.M.; TEREKHOVA, V.F.; NAUMKIN, O.P.; BUROV, I.V.

Obtaining single crystals of scandium, yttrium, and gadolinium.
TSvet. met. 36 no.5:51-52 My '63. (MIRA 16:10)

NAUMKIN, O.P. (Moskva); IG[illegible]TOV, D.V. (Moskva)

Electronography of the oxidation of thin scandium films. Izv. AN SSSR. Met. i gor. delo no.5:141-144 S-O '63. (MIRA 16:11)

L 14963-65 EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(b) AFWL/SSD/ESD(gs)/ESD(t) JD/JG/MLK
ACCESSION NR: AT4048695 S/0000/64/000/000/0067/0070

AUTHOR: Chechernikov, V. I.; Pop, I.; Naumkin, O. P.

TITLE: Magnetic properties of monocrystalline and polycrystalline scandium 27

10 16

SOURCE: Vsesoyuznoye soveshchaniye po splavam redkikh metallov, 1963. 10 Voprosy* teorii i primeneniya redkozemel'ny*kh metallov (Problems in the theory and use of rare-earth metals); materialy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 67-70

TOPIC TAGS: scandium, neodymium, scandium single crystal, polycrystalline scandium, scandium magnetic property

ABSTRACT: The magnetic properties of most paramagnetic transition metals have been studied in detail over a wide temperature range. Scandium, however, has not been tested for magnetic properties, due to the difficulty of obtaining pure scandium. Investigations of the magnetic properties of scandium will provide important information on the degree of localization of d-electrons and the distribution of electron density in the lattice. In the present work, the magnetic susceptibility was measured in a vacuum between 77 and 1100K by the Faraday-Seksmit method, in which the force acting on the sample is measured by a thin elastic ring made of beryllium bronze. Two reflectors are placed on the ring and a light beam is reflected from the first reflector onto the second and into a cathetometer. Deflec-

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L 14963-65
ACCESSION NR: AT4048695

tion of the ray is determined with an accuracy of 0.001 mm. Since scandium is a weakly magnetic metal, admixtures play an important role. Tests show that increasing the metal purity changes the magnetic moment from 1.65 to 1.42, while the paramagnetic Curie point changes from -1180 to -700K. The Curie point was negative for all samples. It is possible, therefore, that scandium shows an antiferrite exchange interaction. However, this requires further testing at lower temperatures. No investigations have been reported on the magnetic properties of monocrystalline scandium, especially since it is very difficult to obtain scandium single crystals. In the present work, this was done by recrystallization annealing in a high vacuum. This method results in the lowest quantity of admixtures. The sample of monocrystalline scandium was placed in a holder in such a way that the magnetic field was directed either parallel or perpendicular to the c axis. The temperature dependence of magnetic susceptibility was investigated in both of these directions. The tests showed that the magnetic susceptibility was higher in a parallel field than in a perpendicular field. This shows that the magnetic moments are oriented along the c axis. The Curie point was -1300K in the parallel magnetic field and -900K in the perpendicular field. Similar relationships between the Curie points of monocrystalline and polycrystalline scandium were obtained with neodymium by D. R. Behrend, S. Legvold and F. H. Spedding. They also found that neodymium was antiferromagnetic at low temperatures. Orig. art. has: 3 figures and 1 table.

L 14963-65

ACCESSION NR: AT4048695

ASSOCIATION: none

SUBMITTED: 13Jun64 ENCL: 00 SUB CODE: MM, EM

NO REF SOV: 002 OTHER: 003

Card 3/3

L 14960-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) ESD(gs) JD/JG/WB/MLK

ACCESSION NR: AT4048696 S/0000/64/000/000/0071/0078

AUTHOR: Naumkin, O. P.; Terekhova, V. F. (Candidate of technical sciences); B
Savitskiy, Ye. M. (Professor, Doctor of chemical sciences)

TITLE: Investigation of the properties of metallic scandium 21
16

SOURCE: Vsesoyuznoye soveshchaniye po splavam redkikh metallov, 1963. Voprosy* teorii i primeneniya redkozemel'ny*kh metallov (Problems in the theory and use of rare-earth metals); materialy* soveschaniya. Moscow, Izd-vo Nauka, 1964, 71-78

TOPIC TAGS: scandium, rare earth metal, scandium purification, scandium oxidation, scandium crystal structure, scandium corrosion 14 18

ABSTRACT: The properties of the rare earth metal scandium have been investigated only during the last 2-3 years. The metal used in the present tests was obtained by thermal reduction of scandium fluoride with calcium, since that obtained by industrial processes contains admixtures such as calcium, oxygen, iron and copper and is not over 96-98% pure. Scandium was purified either by vacuum melting, by electron ray zone melting or by vacuum distillation, the best results being obtained by the last method. Cold drawn/wire 0.8-0.9 mm thick could be obtained from a 5x5 mm distilled sample without

Card 1/3

L 14960-65

ACCESSION NR: AT4048696

prior annealing. Thin films (400A) of pure Sc were then tested for corrosion. After 60 minutes at room temperature, an oxide film was formed on the scandium. After 10 minutes at 100C, the quantity and intensity of Sc_2O_3 lines increased sharply. The non-oxidized metal remained in this condition up to 200C. At 300C for 2 hours, a scandium film 400A thick was oxidized completely. Massive samples with a purity of 99.2% were also tested. The maximal thickness of the oxide film after exposure to air at room temperature for 128 days is about 150 A. The protective properties of this oxide film are preserved only up to 300C. Only scandium oxide is formed on the metal films when they are heated from 20 to 900C. No weight gain is detected when massive samples of scandium are heated up to 300C for 24 hours. The highest rate of scandium oxidation is observed at 600-700C. Electronic and X-ray analysis shows that the outer white layer on massive samples exposed to air consists of Sc_2O_3, while the inner darker layer is ScN. Single crystals of scandium obtained by recrystallization annealing were also tested. This is the best method for preparing rare earth metals, since it ensures the highest purity. Annealing was performed at 1350C for 20 hours. The thermoelectromotive force of a polycrystalline sample was found to be -5.32 μV/degree, compared to

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L 14960-65
ACCESSION NR: AT4048696

3

-2.65 for monocrystalline scandium parallel to the C axis and -8.04 perpendicular to the C axis. The anisotropy of the thermoelectromotive force of monocrystalline scandium was 3.03. Anisotropy of the hardness of single crystals of hexagonal structure is wellknown. Similar anisotropy is therefore not surprising in scandium, which has a hexagonal crystal lattice. "D. V. Ignatov, V. I. Chechernikov and I. Pop also took part in aspects of the work." Orig. art. has: 9 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 13Jun64 ENCL: 00 SUB CODE: IC, MM

NO REF SOV: 004 OTHER: 001

Card 3/3

L 14964-65 EWT(m)/EPF(c)/EPR/EWT(t)/EWP(b) Pr-4/Ps-4 ESD(gs) JD/JG/MLK
ACCESSION NR: AT4048700 S/0000/64/000/000/0112/0115

AUTHOR: Naumkin, O. P.; Terekhova, V. F. (Candidate of technical sciences) 3

TITLE: Metallography of scandium 27

SOURCE: Vsesoyuznoye soveshchaniye po splavam redkikh metallov, 1963. IV Voprosy* teorii i primeneniya redkozemel'ny*kh metallov (Problems in the theory and use of rare-earth metals); materialy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 112-115

TOPIC TAGS: scandium, scandium microstructure, rare earth metal 14

ABSTRACT: Metallographic research on the rare earth metals is hampered by their high reactivity. The authors therefore carried out a metallographic analysis of the admixtures and inclusions in metallic scandium of varying purity obtained by different methods. The microsections were made in the usual way and polished with a compound consisting of a suspension of fine chromium oxide 2 or aluminum oxide powder in dehydrated kerosene. Both etched and non-etched microsections were tested. Scandium was etched by a 3-5% solution of nitric acid in alcohol or by a 3:1 mixture of nitric and hydrofluoric acids. In order to determine the distribution of oxides, the scandium samples were heated in air at 800C for 2 hours. In fairly pure scandium, the admixtures are concentrated at the

0

L 14964-65
ACCESSION NR: AT4048700

grain boundaries, which are clearly seen in the microsections. After prolonged polishing with an aqueous suspension, the microsection is coated with a dark oxide film and the grain boundaries become brighter. This resembles the microstructure of highly oxidized rare earth metals. When scandium is photographed on color film, the grains of various orientation have a bright pink or blue color. The microhardness of the scandium microsection was 120-140 kg/mm^2, while the microhardness of the inclusions was 450-500 kg/mm^2. Orig. art. has: 10 photomicrographs.

ASSOCIATION: None

SUBMITTED: 13Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 001 OTHER: 001

Card 2/2

L 12450-65 EWT(m)/EPF(c)/EWA(d)/EWP(t)/EWP(b) Pr-4 JD/JG/WB
ACCESSION NR: AP4046458 S/0078/64/009/010/2497/2498

AUTHOR: Naumkin, O. P.; Terekhova, V. F.; Savitskiy, Ye. M.

TITLE: Scandium-erbium and scandium-cerium systems

27 27 27 B

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 10, 1964, 2497-2498

TOPIC TAGS: erbium scandium alloy, cerium scandium alloy, erbium scandium system, cerium scandium system, erbium, scandium, cerium, erbium scandium alloy structure, cerium scandium alloy structure

ABSTRACT: A study was made of erbium-scandium and cerium-scandium systems. Nine erbium-scandium alloys and ten cerium-scandium alloys were melted in a tungsten electrode-arc furnace in purified helium 27 from 98.16%- or 99.5%-pure scandium, 99.35%-pure erbium, and 99.5%-pure cerium. Phase diagrams of both systems were plotted from the results of physicochemical analysis (see Figs. 1 and 2 of the Enclosure). The erbium-scandium alloys maintain a hexagonal close-packed structure in the whole composition range studied. In the cerium-scandium system, the high-temperature modifications, δ-Ce and

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L 12450-65
ACCESSION NR: AP4046458

2

β-Sc, form continuous series of solid solutions. It appears, therefore, that the crystal lattice of β-Sc is the same as that of δ-Ce (body-centered cubic). At room temperature the solubility of scandium in cerium is approximately 17 at%, and that of cerium in scandium, approximately 12 at%. Cerium-scandium alloys were found to have a good formability at room temperature. Scandium improves the atmospheric corrosion resistance of cerium, and alloys containing over 17 at% Sc do not need any special protection against oxidation in air. Orig. art. has: 1 table and 2 figures.

ASSOCIATION: none

SUBMITTED: 13Mar64 ENCL: [illegible] SUB CODE: MM

NO REF SOV: 002 OTHER: 000 ATD PRESS: 3125

Card 2/3

L 12450-65

ACCESSION NR: AP4046458

ENCLOSURE: 01

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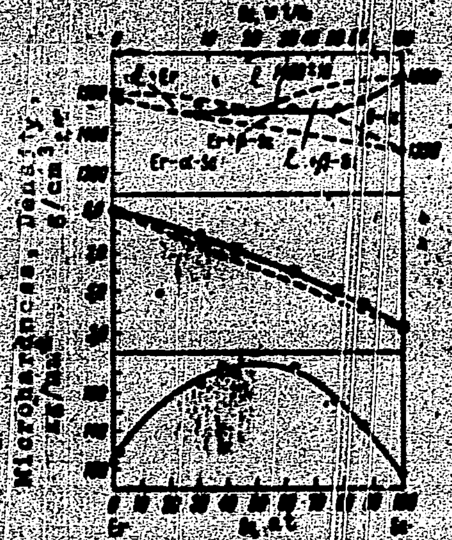

Fig. 1. Er-Sc phase diagram (Dots indicate thermal-analysis data.)

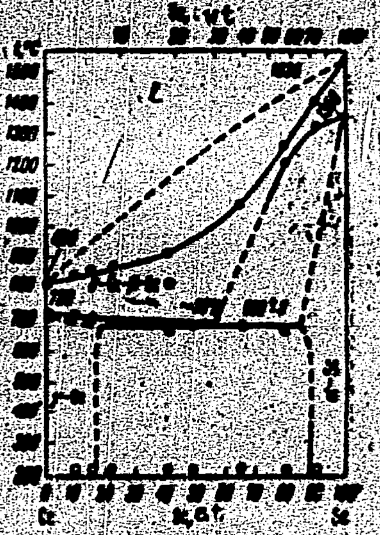

Fig. 2. Ce-Sc phase diagram (Dots indicate thermal-analysis data.)

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L 39464-65 EWT(m)/EWT(b)/EWP(t) IJP(c) JD/JG

ACCESSION NR: AP4047879 S/0279/64/000/005/0142/0146

12

AUTHOR: Naumkin, O. P. (Moscow); Ignatov, D. V. (Moscow)

B

TITLE: Structural-kinetic investigation of the oxidizability of metallic scandium

27

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 5, 1964, 142-146, and insert facing p. 115

TOPIC TAGS: scandium, oxidizability, oxidation kinetics

ABSTRACT: Kinetic and electron-diffraction studies were conducted to determine the oxidizability of scandium in air at temperatures from 300-900 C. An oxide film was detected in the electron diffraction pattern of scandium heated at

oxide film was detected in the electron diffraction pattern of scandium heated at 300 C; the oxidation rate started to increased rapidly at 600C. Sc_2O_3 was formed at all temperatures. ScN was also found in films formed at 700-800C, but was oxidized upon annealing at 1100C for 4 hours. There was no clear separation of the Sc_2O_3 and ScN in the films formed at 800C. The films adhered tightly at all temperatures. They were formed by diffusion of the oxygen and nitrogen through

Card 1/2

L 39464-65

ACCESSION NR: AP4047379

0

the surface oxide deposit. A graphic comparison was made of the oxidizability of the rare earth elements and of the fusion temperature of the rare earth oxides as a function of their periodic number. The oxidizability of the elements was approximately inversely proportional to the fusion temperature of their oxides--further supporting the indication that the properties of the oxide film control further oxidation of these metals. Orig. art. has: 4 figures.

ASSOCIATION: None

SUBMITTED: 10Jan64 ENCL: 00 SUB CODE: MM

ACC NR: AT[illegible]

AUTHOR: Savitskiy, [illegible]

ORG: none

TITLE: Investigation of monocrystals [illegible]

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, [illegible]

TOPIC TAGS: alloy, rare earth metal, phase diagram, metal crystal

ABSTRACT: A method for the growth of monocrystals and Sc, Y, [illegible] developed, and some properties, e.g., microhardness, thermal emf, and magnetic susceptibility, of the crystals were determined. The monocrystals were obtained by high-temperature vacuum annealing of distilled metal specimens possessing a high degree of crystal orientation. The experimental results are presented graphically (see Fig. 1). In addition, the phase diagrams were determined for the binary systems: Sc--Er, Gd--Tb, Ce--Sc, Ce--Gd, Sc--Al, Y--Sn, and Fe--[illegible] (see Fig. 2).

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L 39883-66
ACC NR: AT6016408

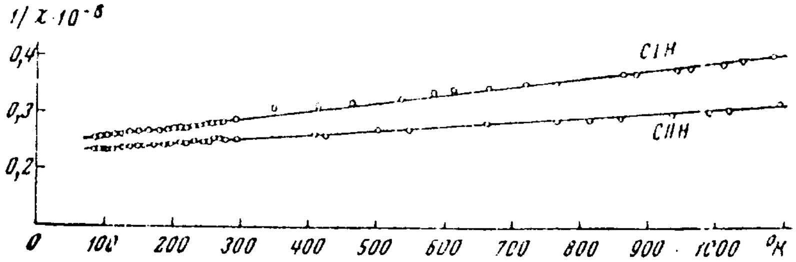

Fig. 1. Anisotropy of the specific magnetic susceptibility in monocrystals of Sc.

Card 2/3

ACC NR: AT6016[illegible]

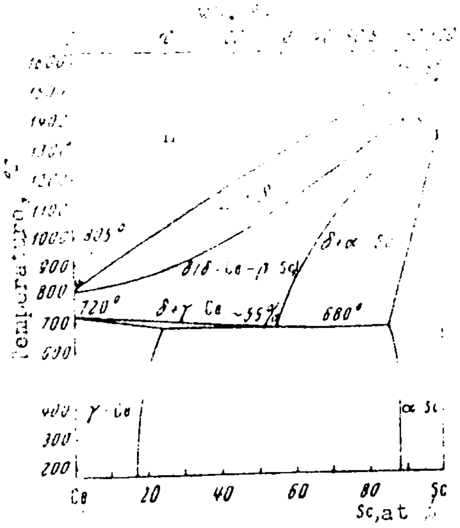

Fig. 2. Phase diagram of the system Ce—Sc.

Orig. art. has: 13 figures.

SUB CODE: 11,20/ SUBM DATE: [illegible]Dec65/ ORIG REF: 007/ OTH REF: [illegible]

Card 3/3

L 32667-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/JG/GD
(A)
ACC NR: AT6016409 SOURCE CODE: UR/0000/65/000/000/0051/0053

AUTHORS: Naumkin, O. P.; Terekhova, V. F.; Chistyakov, O. D.; Savitskiy, Ye. M.

43
B+1

ORG: none

TITLE: Purification of metallic scandium by distillation 18
21

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 51-53

TOPIC TAGS: scandium, metal purification, high purity metal 18

ABSTRACT: Preparation of metallic scandium of 99.4--99.6% purity by distillation of the technical 96--97% material is described as a continuation of the study of the physical and chemical properties of this metal by Ye. M. Savitskiy, V. F. Terekhova, O. P. Naumkin, and I. V. Burov (Tsvetnyye metally, 1963, No. 5, 51). The distillation was performed at 1650C and 10^{-4} mm Hg in an apparatus presented schematically in Fig. 1. Microscopic study of the obtained product shows improvement in its structure. The hardness and electrical resistance are lowered while ductility of the purer material is increased. Detailed chemical analysis of the product is reported. The authors express their gratitude to A. N. Shteynberg (IMYeT im. A. A. Baykov) for spectral analysis and to R. M. Liberman (Giredmet) for collaboration.

Card 1/2

L 32667-66

ACC NR: AT6016409

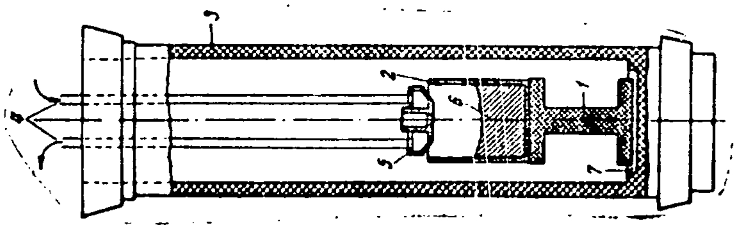

Fig. 1. Diagram of the equipment for distillation of metallic scandium: 1 - graphite base; 2 - tantalum crucible; 3 - graphite heater; 4 - water; 5 - copper condenser; 6 - metallic scandium; 7 - beryllium oxide packing.

Orig. art. has: 2 figures and 1 table.

SUB CODE: 11,07/ SUBM DATE: 16Sep65/ ORIG REF: 005/ OTH REF: 002

Card 2/2 BLG

L 2098-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/JG

ACCESSION NR: AP5021505 UR/0370/65/000/004/0176/0182
669.017.12

57
51
B

AUTHOR: Naumkin, O. P. (Moscow); Terekhova, V. T. (Moscow); Savitskiy, Ye. M. (Moscow)
44,55 44,55

TITLE: Phase diagram and the properties of alloys of the aluminum-scandium system
14 14 44,55,27 27

SOURCE: AN SSSR. Izvestiya. Metally, no. 4, 1965, 176-182

TOPIC TAGS: aluminum, scandium, aluminum scandium alloy, aluminum scandium system

ABSTRACT: 7 A large series of aluminum-scandium alloys melted from 98.16- or 99.5%-pure Sc and 99.99%-pure Al has been studied. On the basis of the results obtained, a phase diagram of the Al-Sc system (see Fig. 1 of the Enclosure) was plotted. The investigations showed that Al and Sc have unlimited solubility in the liquid state. The room-temperature solubility of Sc in Al is approximately 0.5 at% and that of Al in Sc approximately 4 at%. Four compounds: $ScAl_3$, $ScAl_2$, ScAl, and Sc_2Al were identified. All the compounds are brittle and crack during solidification. The microhardness is 255, 530, 370, and 460 kg/mm for $ScAl_3$, $ScAl_2$,

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L 2098-66

ACCESSION NR: AP5021505

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$ScAl$, and Sc_2Al, respectively. Alloying with Sc increases the tensile strength at room and elevated temperatures without a noticeable decrease in ductility (see Fig. 2 of the Enclosure). The strengthening effect of Sc is much stronger than that of rare-earth metals. Orig. art. has: 6 figures and 1 table. [WW]

27

ASSOCIATION: none

SUBMITTED: 29May64 ENCL: 02 SUB CODE: MM,SS

NO REF SOV: 009 OTHER: 004 ATD PRESS: 4113

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ACCESSION NR: AP5021505 **ENCLOSURE: 01**

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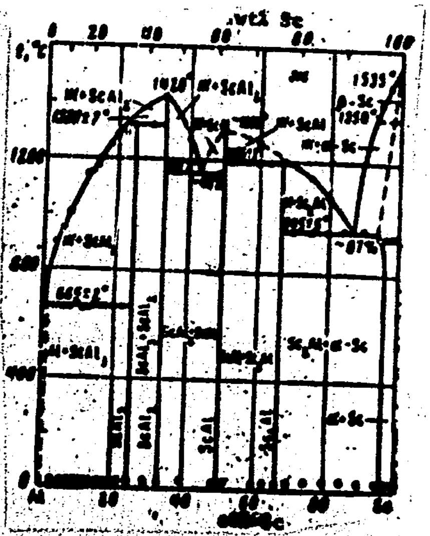

Fig. 1. Phase diagram of the Al-Sc system

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ACCESSION NR: AP5021505 ENCLOSURE: 02

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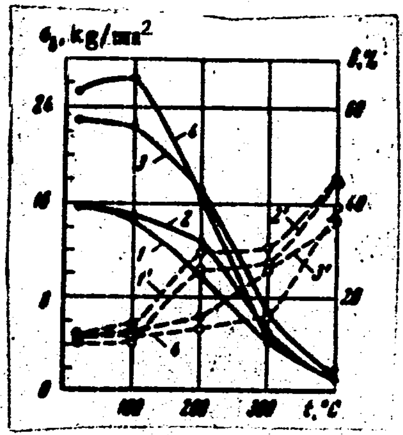

Fig. 2. Effect of Sc on tensile strength (σ_b - continuous lines) and elongation (δ - dash lines) of Al at various temperatures (1,1-pure Al; 2,2' - addition of 0.1 at% Sc; 3,3' - 0.3 at% Sc; 4,4' - 0.7 at% Sc)

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L 14617-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b) IJP(c) GG/JD/JG

ACC NR: AT6002265 (A) SOURCE CODE: UR/2564/65/006/000/0301/0307 40

AUTHOR: Savitskiy, Ye. M.; Terekhova, V. F.; Naumkin, O. P.; Burov, I. V. 37

ORG: none

55,27 18 B+1

TITLE: Preparation and properties of rare earth single crystals [Paper presented at the Third Conference on Crystal Growing held in Moscow from 18 to 25 November, 1963] III

SOURCE: AN SSSR. Institut kristallografii. Rost kristallov, v. 6, 1965, 301-307

TOPIC TAGS: single crystal growing, rare earth metal, crystallization

21,44,55

ABSTRACT: A technique and apparatus were developed for purifying and growing single crystals of rare earth metals. The growing technique consisted of (1) purifying technical-grade metals by vacuum distillation; (2) vacuum remelting of the distillate with directional crystallization; and (3) recrystallization annealing in a high vacuum. Single crystals of scandium, yttrium, gadolinium, and neodymium 8 x 10 x 12 mm were thus grown, and some physical constants and anisotropy of the mechanical, electrical, and magnetic properties were determined along various crystallographic directions. The data obtained showed that

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2

L 14617-66

ACC NR: AT6002265

3

a complex electron spin configuration exists in gadolinium at temperatures below 75C. V. Ye. Kolesnichenko participated in the work of growing yttrium and neodymium single crystals. Orig. art. has: 8 figures.

27 27

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 004 / OTH REF: 001

TS

Card 2/2

SAVITSKIY, Ye.M.; TEREKHOVA, V.F.; BUROV, I.V.; NAUMKIN, O.P.; MARKOVA, I.A.

Alloys and compounds of rare-earth metals. Izv.AN SSSR.Neorg.mat. 1 no.10:1648-1659 O '65. (MIRA 18:12)

1. Institut metallurgii imeni A.A.Baykova, Moskva. Submitted July 5, 1965.

L 57813-65 EWT(m)/EWP(t)/T/EWA(d)/EWP(w)/EWP(t) IJP(c) JD/JG

ACCESSION NR: AP5008796 S/0126/65/019/003/0466/0468 34

539.292; 548.0:538 33

AUTHOR: Pop, I.; Chechernikov, V. I.; Naumkin, O. P.; Savitskiy, Ye. M. B

TITLE: Magnetic properties of Er-Sc alloys

21 21

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 3, 1965, 466-468

TOPIC TAGS: nonferrous metal alloy, antiferromagnetic material, metal magnetic property

ABSTRACT: Procedures employed in the preparation of test specimens of Er-Sc alloys are described. An investigation of the temperature dependence of the magnetic permeability indicated it is possible that an antiferromagnetic exchange reaction occurs in these alloys as in alloys of Er-Yt. 21 In alloys with a high content of erbium, antiferromagnetism is basically conditioned by the properties of erbium among which there is a complex spin-spiral structure in which antiferromagnetic reactions occur in addition to the positive reactions. The paramagnetic properties of these alloys are basically conditioned by the localized *f*-electrons whereby the change of permeability follows the Curie-Weiss law, with a term independent of temperature. This

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ACCESSION NR: AP5008796

causes a sharp reduction in the slope of $1/\chi$-to-T curves. Any conclusions concerning the existence of antiferromagnetism in alloys with high contents of scandium would be premature even though the Curie paramagnetic point is less than zero. Orig. art. has: 2 figures, 1 table.

ASSOCIATION: Moskovskiy gosuniversitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 20Apr64 **ENCL: 00** **SUB CODE: MM, EM**

NO REF SOV: 003 **OTHER: 002**

Card 2/2

ACC NR: AP6035677 (A,N) SOURCE CODE: UR/0413/66/000/019/0026/0026

INVENTOR: Simonov, V. D.; Shakirova, A. M.; Savin, V. P.; Zvereva, V. V.; Romanovich, V. I.; Naumkin, P. V.

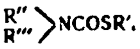
ORG: none

TITLE: Preparation of thiolcarbamates. Class 12, No. 186437 [announced by Ufa Branch of the All-Union Scientific Research Institute of Chemicals for Plant Protection (Ufimskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh sredstv zashchity rasteniy)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 19, 1966, 26

TOPIC TAGS: thiolcarbamate, carbamic acid, organic salt, alkyl halide, halide

ABSTRACT: In the proposed method for preparing thiolcarbamates of the general formula



$$\begin{matrix} R'' \\ R''' \end{matrix} \!\!> NCOSR'$$

(where R', R", and R"' are saturated alkyls) by the reaction of salts of thiocarbamic acid with alkyl halides on heating, saturated alkyl halides are used as the alkylation reagents and the process is conducted

Card 1/2 UDC: 547.496.1.07

ACC NR: AP6035677

at 100—130°C, 5—10 atm in an inert solvent, e.g., petroleum ether.
[W.A. 50]

SUB CODE: 07/ SUBM DATE: 09Nov65

Card 2/2

NAUMKIN, V.M.

Introducing the 10GKh support pump. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 18 no.6:7-8 Je '65.
(MIRA 18:7)

CHERTAVSKIKH, A.K.; NAUMKINA, I.V.; Prinimal uchastiye MAKSIMOV, V.A.

Use of generator and natural gases for the nonoxidizing heating of nonferrous metals. TSvet. met. 35 no.3:74-77 Mr '62. (MIRA 15:4)

(Nonferrous metals) (Furnaces, Heating)

SOV/46-5-2-11/34

AUTHORS: Naumkina, N.I., Tartakovskiy, B.D., and Efrussi, M.M.

TITLE: Experimental Study of Certain Vibration-Absorbing Materials (Eksperimental'noye issledovaniye nekotorykh vibropogloshchayushchikh materialov)

PERIODICAL: Akusticheskiy zhurnal, 1959, Vol 5, Nr 2, pp 196-201 (USSR)

ABSTRACT: Vibration noise can be reduced by covering appropriate members of machines and structures with layers of vibration-absorbing (v.a.) materials which are characterized by high internal mechanical losses. If a metal rod is covered by a thick layer of a v.a. material, then the mechanical losses and consequent noise reduction are determined primarily by the losses in the v.a. material itself. If the layer of the v.a. material is thin, the loss coefficient η of the composite rod is a function of the product $\eta_2 E_2$

Card 1/6 where η_2 and E_2 are the loss coefficient and Young's

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Experimental Study of Certain Vibration-Absorbing Materials

modulus of the v.a. material. The present paper reports measurements of η_2 and E_2 of v.a. materials at acoustic frequencies. Measurements were made either on rods or strips of v.a. materials, or, if these were not strong enough, a metal rod was covered by a layer of a v.a. material and the system was measured as one unit (Ref.2). In either case vibrations were produced by means of an electromagnet. Since v.a. materials are normally non-magnetic, a piece of Permalloy foil was wrapped round the free end of the tested v.a. rod or strip. The apparatus used to test strips or rods of v.a. materials by themselves is shown in Fig.1. Vibrations were recorded by means of a microphone placed at a certain distance from the sample. The voltage across the microphone output was proportional to the vibrational velocity of the rod or strip, and from the maximum of this velocity the resonance frequency and Young's modulus were deduced. The loss coefficient η_2 was deduced from a record of decay of the resonance vibrations of the sample:

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$$\eta_2 = (1/\pi)\ln(A_n/A_{n+1})$$

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where A_n and A_{n+1} are successive vibration amplitudes. When the internal losses of the material were small ($\eta_2 < 0.01$) the decaying vibrations were recorded by means of Neyman-type apparatus and the rate of decay L(db/sec) was determined. The rate of decay is related to the loss coefficient by

$$L = 27.29 f\eta_2$$

where f is the frequency. The errors in measurements of E_2 were of the order of 3%, and of η_2 of the order of 5%. When a v.a. material was tested in the form of a layer on a metal rod the composite system was suspended horizontally, as shown in Fig.2. To determine E_2 and η_2, the resonance frequency f and the mass per unit length m were determined both for the metal rod and for the metal rod with the v.a. layer on it (the appropriate formulae are given by Eqs.(8) and (3)). The error in measurement of Young's modulus E_2 by the composite rod method was of the order of 10%, and the loss coefficient η_2 was measured with an accuracy of 12%.

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Experimental Study of Certain Vibration-Absorbing Materials

The values of E_2 and η_2 given in the present paper are averages of values obtained at 10-200 c/s and vibration amplitudes ranging from 0.001 to 0.1 mm. Among v.a. materials tested was "izol" which consists of rubber powder treated with softeners of bitumen and coumarone resin type until the stage of partial de-vulcanization was reached. This treatment was carried out at 160-170°C at atmospheric pressure. After cooling to 60-70°C the material was rolled to produce an elastic rubber-like sheet. The authors tested pure "izol" and "izol" filled with asbestos, cellulose, cord fabric, slag (mineral) wool and with other materials. The results of these tests are shown in Fig.3. This figure shows that if the v.a. layer can be made of any thickness, then the best materials are "izols" filled with asbestos or with textile fibres. If the thickness of the v.a. layer has to be kept within certain limits the noise-absorbing quality of the material is given by the product $E_2\eta_2$; in this case the best material of those shown in Fig.3 is the cellulose-filled "izol". A second group of materials tested consisted of felts impregnated with bitumen, or "izol"

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Experimental Study of Certain Vibration-Absorbing Materials

mastic filled with asbestos or cellulose. The results are given in Fig.4. This figure shows that the felt materials have a low Young's modulus and can reduce noise effectively only when used in the form of thick layers. Nevertheless the best of these materials (a felt impregnated with bitumen and covered by asbestos-based "izol" mastic) can be regarded as a useful v.a. material because its $E_2\eta_2$ product is of the order of 2×10^9. The best properties were exhibited by laminar materials in which the "izol" mastic was combined with elastic layers such as cable paper and aluminium foil (Fig.5). Acknowledgment is made to D.D. Surmeli and Ch.D. Marr for preparation and supply of the majority of materials described in the present paper. There are 5 figures and 3 references, of which 1 is Soviet, 1 German and 1 translation of English into Russian.

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SOV/46-5-2-11/34

Experimental Study of Certain Vibration-Absorbing Materials

ASSOCIATION: Akusticheskiy institut AN SSSR, Moskva (Acoustics Institute, Ac. Sc. USSR, Moscow)

SUBMITTED: May 20, 1958

Card 6/6

NAUMKINA, N.I.; TARTAKOVSKIY, B.D.; EFRUSSI, M.M.

Two-layer vibration-absorbing structure. Akust.zhur. 5 no.4: 498-501 '59. (MIRA 14:6)

1. Akusticheskiy institut AN SSSR, Moskva.
(Damping (Mechanics))

L 20209-65 EPA(s)-2/EWT(m)/EPR/EWP(j)/EPF(c) Pc-4/Pr-4/Ps-4 AFWL/
ASD(f)-3/RAEM(i)/ESD(gs) WW/RM
ACCESSION NR AP4046899 S/0191/64/000/010/0036/0040 4/

AUTHOR: Trepelkova, L. I.; Paley, M. I.; Tartakovskiy, B. D.; Naumkina, N. I. B

TITLE: Effect of various components on the damping properties 15 of polymeric materials

SOURCE: Plasticheskiye massy*, no. 10, 1964, 36-40

TOPIC TAGS: filler, plasticizer, polymer acoustic property, damping, vibration absorption, Young modulus, elasticity, internal loss factor, rigidity, poly/vinylchloride/, Vinylite, glass temperature

ABSTRACT: The authors investigated the effect of different plasticizers 15 and fillers on the ability of poly/vinylchloride/ 15 and a copolymer of vinylchloride with vinylacetate (Vinylite) 15 to absorb acoustic vibrations, a property which is directly dependent on the product of the Young modulus and internal loss factor. Low molecular weight plasticizers are often added to such polymers to lower the glass temperature, since the maximum damping takes place in this range and since the glass temperature of the pure polymers is too high to be useful (60-85C). When the Young modulus E and internal loss factor η were plotted against plasticizer content, for either polymer, both high- and low-molecular weight plasticizers were found to decrease E and increase η, while the product $\eta \cdot E$ passed through a maximum

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ACCESSION NR: AP4046899

6

at about 20-30 parts by weight of plasticizer per 100 parts by weight of polymer. The deficiencies of either the high- or low-molecular weight plasticizers can be overcome by adding both together, which has the same effect on the damping properties (value of $\eta \cdot E$). The addition of fillers such as titanium dioxide, kieselguhr, mica or fiberglass 15 to increase the rigidity has exactly the opposite effect on and E, but the product $\eta \cdot E$ and hence the damping properties still tends to pass through an optimum at a filler content depending on the polymer used. Thus, for poly /vinylchloride/, optima are obtained at 15 and 30 parts by weight of filler, while for polyethylene 15 and polyisobutylene, 15 the optimum is at 70-80 parts by weight per 100 parts by weight of polymer. Finally, tabulated data for the acoustic properties of a number of plastics reinforced with metal 15 or glass show that E is increased 2.5-12 fold in all cases, while η is decreased 20-30% and the product $\eta \cdot E$ is consequently increased 2-4 fold by a reinforcing layer. "V. A. Gulyayev and N. P. Shevel'kova took part in the experimental work." Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 003 OTHER: 002

Card 2/2

L 18446-66 EWT(m)/EWP(j)/T WW/RM

ACC NR: AP6002546 (A) SOURCE CODE: UR/0286/65/000/023/0045/0046

AUTHORS: Trepelkova, L. I.; Tartakovskiy, B. D.; Paley, M. I.; Menukina, N. I.; Li, P. Z.

33 B

ORG: none

15 44 55

TITLE: Method for plasticising epoxy resins and compositions based on them. Class 39, No. 176675 12

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 45-46

TOPIC TAGS: epoxy plastic, plasticizer, polyether/ FUA-5 polyether

ABSTRACT: This Author Certificate presents a method for plasticising epoxy resins and compositions based on them by using polyether. To broaden the selection of plasticizers and to add vibration absorption properties to the epoxy compositions, the polyether FUA-5 is used as the plasticiser. This is a product of the interaction of dibutyladipinate and a mixture of diethylene glycol and ethylene glycol.

SUB CODE: 11, 07/ SUBM DATE: 21Jan65

Card 1/1 UDC: 678 643.42'5 678 674.048

NAUMKINA, V S

15-1957-7-8954

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 7, p 10 (USSR)

AUTHOR: Nechayeva, M. A., Karpov, P. A., Naumkina, V. S.

TITLE: New Data on the Stratigraphy and Lithology of the Devonian Deposits of the Stalingrad Oblast (Novyye dannyye po stratigrafii i litologii devonskikh otlozheniy Stalingradskoy oblasti)

PERIODICAL: Novosti neft. tekhniki. Geologiya, 1956, Nr 2, pp 3-6

ABSTRACT: This is a report of the results of stratigraphic and lithologic studies on the Middle and Upper Devonian rocks which have been uncovered in drill holes within the Don-Medveditsa arch and on the eastern slope of the Voronezh massif. The subdivision of these deposits is based on their similarity to rocks of the same age in the central region and on the study of brachiopods and ostracodes. The Middle Devonian is divided into Morsovskiy beds of argillite, siltstone, and anhydrite;

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New Data on the Stratigraphy and Lithology of the Devonian Deposits of the Stalingrad Oblast (Cont.)

Mosolovskiy beds of brownish-gray limestone with layers of argillite and marl; and Starooskolskiy beds subdivided (from the base) into lower carbonate-clay, middle clay-siltstone, and upper carbonate-clay groups. Two different sections have been identified in the Upper Devonian: carbonate proper, in the northern part of the Donets-Medveditsa arch, and carbonate-clay-sand, in the southern part. The Frasnian rocks are divided as follows: Lower Shchigrovskiy beds, which are subdivided into a lower sand-silt-clay and an upper carbonate-clay group; Upper Shchigrovskiy beds, composed of limestone with interlayered argillite at the base; Semilukskiy-Peninskiy beds, subdivided into clastic-carbonate, clay-sand, and clay-carbonate groups; Voronezh beds, composed of limestone with layers of argillite (sandstone and argillite predominate in the southern part); Yevlanovskiy-Livenskiy beds, composed (toward the south) of clastic beds at the base and clay-carbonate layers above and toward the north of dolomitized limestone. The Famennian rocks include Zadonskiy-Yeletskiy

NAUMOV, A., fomernok

Mechanization of track maintenance and construction in the Soviet Union. Vasut 13 no.12:21-23 D '63.

1. Szovjet Vasutak Palyafenntartasi es Epitesi Igazgatosaga.

NAUMOV, A.

Youth aligns on veterans. Voen.znan. 41 no.11:28 N '65.
(MIRA 18:12)

1. Zamestitel' predsedatelya Volgogradskogo oblastnogo komiteta Vsesoyuznogo dobrovol'nogo obshchestva sodeystviya armii, aviatsii i flotu SSSR.

NAUMOV, A A

PHASE I BOOK EXPLOITATION SOV/4208

Matveyev, Viktor Vasil'yevich, and Anatoliy Aleksandrovich Naumov

Press-poluavtomat MPS dlya vulkanizatsii rezinovykh detaley (The MPS Semiautomatic Press for Vulcanization of Rubber Parts) Moscow, Gizlegprom, 1958. 106 p. (Series: Novoye otechestvennoye oborudovaniye) 1,500 copies printed.

Reviewer: B. A. Safray, Candidate of Technical Sciences; Ed.: A. I. Guseva; Tech. Ed.: ~~L.~~ Ya. Medvedev.

PURPOSE: This booklet is intended for engineers and technicians in the synthetic leather, rubber, and plastics industries.

COVERAGE: In the booklet problems in the construction, assembly, and maintenance of the MPS semiautomatic press manufactured by the Orlovskiy machine-building plant imeni Medvedev for forming and vulcanizing rubber and plastic articles are discussed. Causes of breakdown and ways of correcting them are analyzed. Variations in the design of the press mold for different forming operations are given. In the appendix data on bearings, chain and belt drives, steam and

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